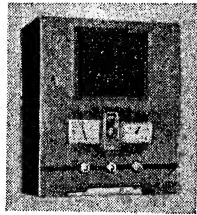


"TRADER" SERVICE SHEET

551

REVISED ISSUE OF  
SERVICE SHEET No. 32



The Aerodyne Merlin receiver.

A SPRING-DRIVEN clock, whose dial matches the tuning scale, is fitted in the Aerodyne Merlin. The receiver employs a 3-valve, 2-band TRF circuit, and provision is made for a gramophone pick-up and extension speaker.

Release date: 1934.

CIRCUIT DESCRIPTION

Aerial input via coupling coils **L1, L2** to capacity coupled band-pass filter. Primary coils **L3, L4** are tuned by **C10**; secondaries **L5, L6** by **C12**; coupling by condensers **C1** and **C2**.

First valve (**V1**, Mullard metallised **VP2**) is a variable-mu pentode operating as RF amplifier. Gain control by potentiometer **R2**, which varies GB applied.

Tuned-anode coupling by **L7, L8** and **C14** between **V1** and triode detector valve (**V2**, Mullard metallised **PM1HL**) which operates on the grid leak system with **C4** and **R4**. Reaction is applied from anode

# AERODYNE MERLIN

## BATTERY TRF RECEIVER

by coil **L9** and controlled by variable condenser **C16**. RF filtering by **C5, L10** and **C6**. Provision for connection of gramophone pick-up in control grid circuit. Parallel-fed transformer coupling by **R5, C7** and **T1** between **V2** and pentode output valve (**V3**, Mullard **PM22A**). Fixed tone correction by **R7, C9** in anode circuit. Provision for connection of low impedance external speaker across **T2** secondary.

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 CG decoupling	20,000
R2	V1 gain control	8,000
R3	V1 anode and SG HT feed	8,000
R4	V2 grid leak	500,000
R5	V2 anode load	30,000
R6	V2 anode decoupling	10,000
R7	Part fixed tone corrector	30,000
R8	V3 grid stopper	250,000

CONDENSERS		Values (μF)
C1	Band-pass coupling condensers	Very low
C2		0.02 μ
C3	V1 anode and SG decoupling	0.1
C4	V2 CG condenser	0.00005
C5	RF by-pass condensers	0.0003
C6		0.0005
C7	AF coupling to T1	0.05
C8	V2 anode decoupling	1.0
C9	Part fixed tone corrector	0.01
C10†	Band-pass pri. tuning	0.0005
C11‡	B-P pri. MW trimmer	—
C12†	Band-pass sec. tuning	0.0005
C13‡	B-P sec. MW trimmer	—
C14†	V1 anode circ. tuning	0.0005
C15‡	V1 anode MW trimmer	—
C16†	Reaction control	0.0005

† Variable.

‡ Pre-set.

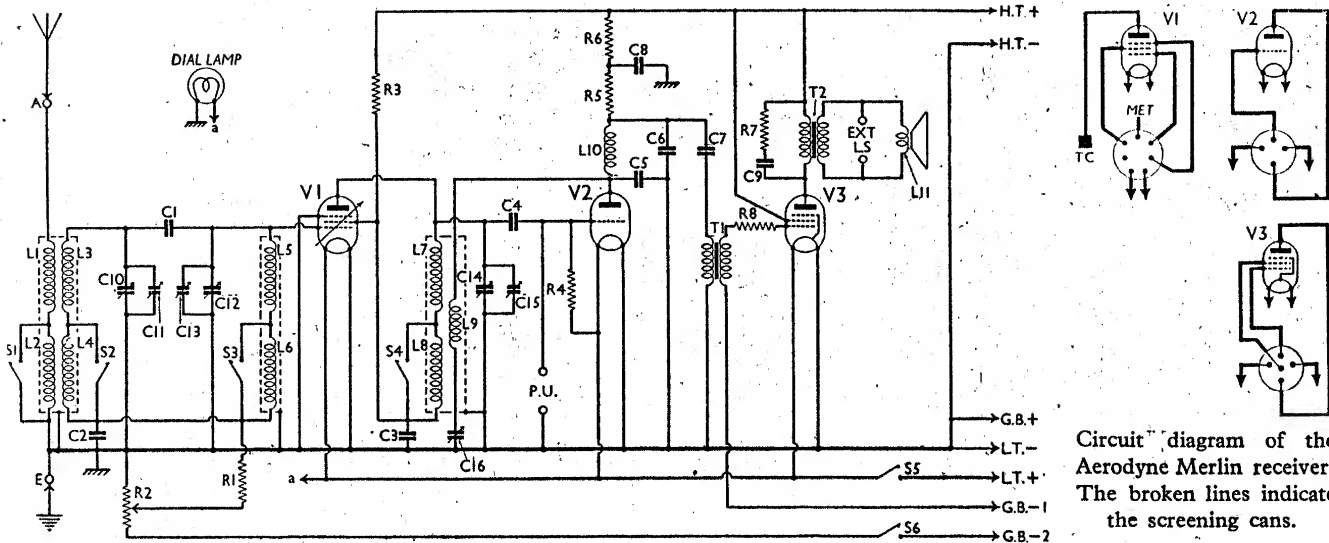
OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coils	0.75
L2		14.25
L3	Band-pass primary coils	3.75
L4		13.5
L5	Band-pass secondary coils	3.75
L6		15.5
L7	V1 anode circuit tuning coils	3.75
L8		14.5
L9	Reaction coil	6.5
L10	V2 anode RF choke	260.0
L11	Speaker speech coil	2.0
T1	Intervalve trans. (Pri. Sec.)	1,350.0
T2	Speaker input (Pri. Sec.)	4,000.0
S1-S4	Waveband switches	0.2
S5	LT circuit switch	—
S6	GB circuit switch	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those to be expected in the average chassis when it is operating with a new HT battery, with the volume control at maximum, the reaction control at minimum, and with no signal input. Voltages were measured on the 1,200 V scale of an Avometer, whose negative lead was connected to chassis.

The anode current of **V1** should be measured with the milliammeter connected in the low potential end of the circuit.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2	115	1.85	115	0.75
V2 PM1HL	65	1.75	—	—
V3 PM22A	130	7.0	140	1.7



Circuit diagram of the Aerodyne Merlin receiver. The broken lines indicate the screening cans.

**Removing Chassis.**—Remove the four control knobs (pull-off); remove the battery shelf (two wood screws); unsolder the two leads from the speaker transformer; remove the clock control rods, turning the winder clockwise; the hand-setting rod pulls off; remove the rectangular stirrup (two nuts) holding the scale in position, and two further nuts; remove the four screws holding the chassis to the base of the cabinet.

**Removing Speaker.**—Remove eight nuts holding the four metal clamps at the rim of the speaker, and the two wood screws holding the transformer bracket to the top of the cabinet.

**Removing Clock.**—Remove the three knurled screws holding the back-plate to the front of the cabinet.

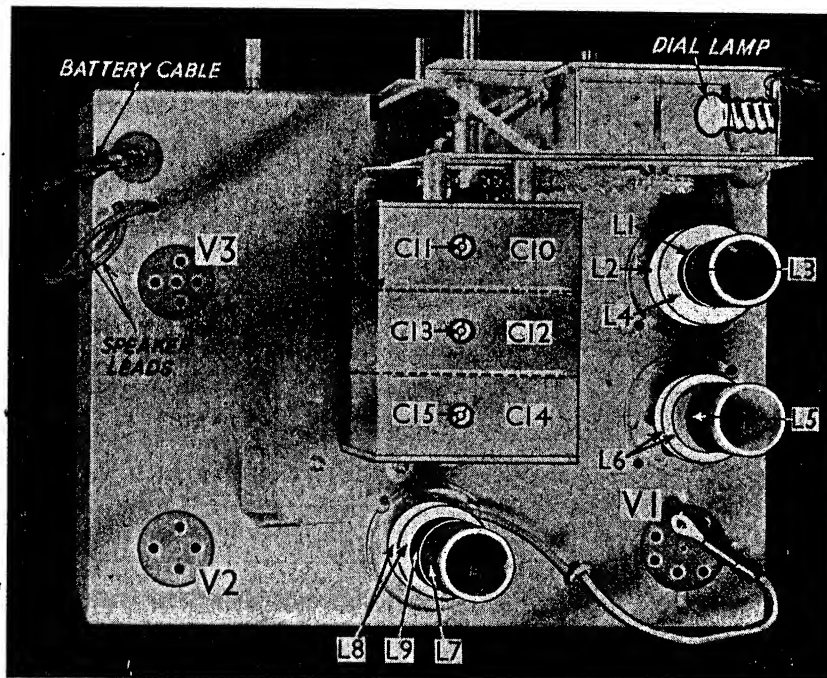
### GENERAL NOTES

**Switches.**—S1, S4 are the waveband switches, and S5, S6 the battery switches, in a single assembly beneath the chassis. This is shown in our under-chassis view, where the individual switches are indicated. S1-S4 are all closed on MW, and open on LW.

**Coils.**—The tuning coils are in three screened units on the chassis deck. They are indicated in our plan view, where the screens have been removed for photographing purposes.

The RF choke L10 is fitted beneath the chassis deck, and is seen in our under-chassis view to the right just below the switch assembly.

**Dial Lamp.**—This is an Osram MES type, with a mushroom bulb, rated at 2.5 V, 0.2 A. A low-consumption type



Plan view of the chassis. The coil screens have been removed to show the positions of the windings. The three trimmers are indicated on the gang.

could be used if available, and the bulb-size is not critical, since there is plenty of room for a large bulb.

**External Speaker.**—Two sockets are provided on the internal speaker input transformer T2, for a low-impedance (24 Ω) external speaker.

**Gramophone Pick-up.**—Two sockets are provided for the connection of a gramophone pick-up, but an external volume control must be employed. When the pick-up is in use the receiver must be detuned to avoid radio break-through.

**Condenser C1.**—This is a very small capacity formed by spiral wire wound over a straight insulated wire.

**Batteries and Leads.**—The recommended HT battery is a GEC type L258; it consists of a 130 V HT section plus a 9 V GB section, and the two sections are connected internally.

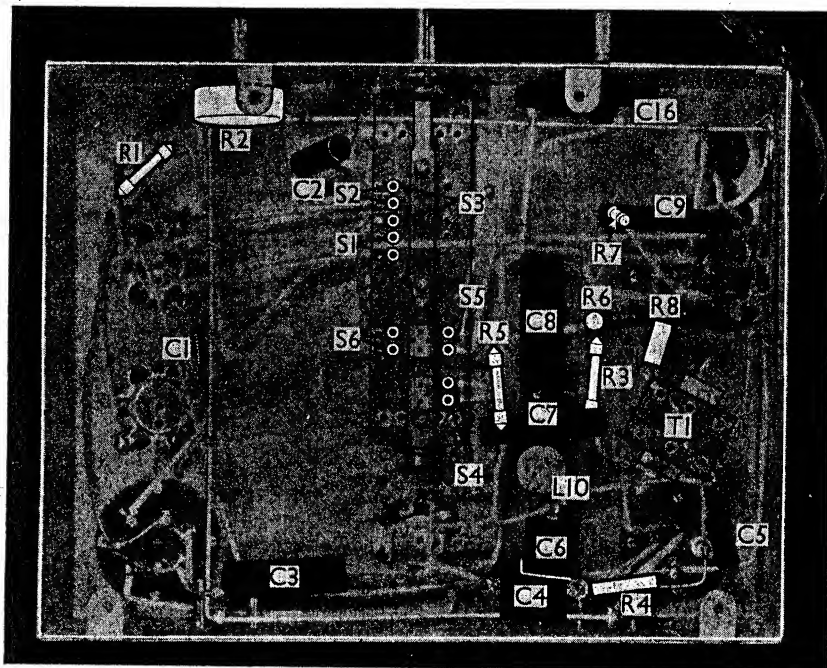
The leads are: black lead, spade tag, LT-; red lead, spade tag, LT+ 2 V; white lead and plug, HT-; maroon lead and plug, HT+ 130 V; blue lead and plug, GB-1 4.5 V; green lead and plug, GB-2 9 V. No GB+ lead is fitted, as the connection occurs in the HT battery, but one could be connected to the HT- lead if separate HT and GB batteries were used.

### CIRCUIT ALIGNMENT

Connect signal generator via a suitable dummy aerial to A and E sockets, turn volume control to maximum, and reaction control to minimum.

Switch set to MW, tune to 214 m on scale, feed in a 214 m (1,400 KC/S) signal, and adjust C11, C13 and C15 for maximum output. Now advance the reaction to a point just short of oscillation, and readjust C15 and the reaction control in turn for maximum output. Readjust C11 and C13.

Check the performance and calibration at several points on the MW band, then on the LW band, and if necessary adjust the pointer for the best compromise at all scale settings.



Under-chassis view. The switch unit is seen at the centre, and the individual switches are indicated. C1, seen on the left, is a small condenser made of wire.